

SPECIAL ISSUE OF

ASME Journal of Electrochemical Energy Conversion and Storage

ON

**HEAT TRANSFER AND THERMAL MANAGEMENT IN LI-ION CELLS
AND BATTERY PACKS**

Li-ion cells and battery packs are being widely investigated for energy conversion and storage in several applications such as transportation, grid energy storage, aerospace applications, etc. Poor heat transfer in Li-ion cells and battery packs is known to result in serious performance and safety challenges. For example, the physics of heat transfer in battery materials is not well known. Extensive thermal management is often needed in battery packs that increases system weight and reduces energy storage density. Aggressive steps also need to be taken in order to prevent thermal runaway that occurs if the cell temperature exceeds a certain threshold. In general, heat transfer in Li-ion cells is a challenging, multiphysics problem because of the close coupling between heat transfer and electrochemistry in the cell. Further, this is a multiscale problem, encompassing heat transfer at the scale of electrode materials all the way to thermal management of large battery packs. A complete understanding and thermal optimization of these devices and systems requires not only a fundamental understanding of heat transfer physics, but also robust engineering techniques for designing and optimizing effective thermal management of cells and packs. A symposium on Thermal Management for Electrochemical Energy Storage will be organized during the ASME Summer Heat Transfer Conference and the 13th International Conference on Energy Sustainability (July 15-19, 2019, Bellevue, WA) to discuss these advances under Track K-6 Heat Transfer in Energy Systems and Track 8 Electrochemical Energy Conversion and Storage.

In light of the timeliness and importance of these research challenges related to heat transfer in Li-ion cells, the *ASME Journal of Electrochemical Energy Conversion and Storage* plans to publish a Special Issue on “Heat Transfer and Thermal Management in Li-ion Cells and Battery Packs”. The Special Issue will be edited by Ankur Jain of The University of Texas at Arlington

and George Nelson of the University of Alabama in Huntsville. This special issue is expected to contain invited review articles and contributed research articles.

The Special Issue is envisioned to cover the entire range of heat transfer research relevant to Li-ion cells, with equal emphasis on both experimental and theoretical research. Specific topics of interest include, but are not limited to measurements of thermal properties of materials, devices and components, microscale thermal transport modeling and measurements, novel thermal management approaches, run-time battery thermal management, modeling and measurements related to thermal runaway, thermal design and optimization of cells, components and packs, coupled thermo-electrochemistry of Li-ion cells, etc.

All manuscripts will be peer-reviewed per ASME requirements, and must abide by the standards of the *Journal of Electrochemical Energy Conversion and Storage*. The tentative publication timeline is as follows:

- Draft manuscripts submitted by August 15, 2019
- First reviews completed by September 15, 2019
- Revised and final manuscripts completed by October 23, 2019 (Accepted manuscripts will appear on-line immediately)
- Publication Date: November 2019 issue

Draft manuscripts, prepared per ASME and JEECS guidelines should be submitted electronically at <http://journaltool.asme.org>. Please select the special issue *Heat Transfer in Li-ion Cells* when submitting your paper.

Please direct questions and enquiries to Ankur Jain (jaina@uta.edu), George Nelson (george.nelson@uah.edu), or Wilson Chiu (wchiu@engr.uconn.edu).